

STATE OF CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS  
DIVISION OF WATER RESOURCES

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EARL WARREN, Governor

C. H. PURCELL, Director of Public Works

EDWARD HYATT, State Engineer

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R E P O R T O N  
W A T E R M A S T E R S E R V I C E

I N

SOUTH FORK PIT RIVER WATERMASTER SERVICE AREA  
MODOC AND LASSEN COUNTIES, CALIFORNIA

1947 SEASON

Sacramento, California

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EDWARD HYATT, STATE ENGINEER  
CHIEF OF DIVISION

EARL WARREN  
GOVERNOR OF CALIFORNIA

C. H. PURCELL  
DIRECTOR

STATE OF CALIFORNIA  
**Department of Public Works**  
SACRAMENTO

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January 19, 1948

Mr. Gordon Zander  
Principal Hydraulic Engineer  
Sacramento, California

Dear Sir:

Herewith is submitted the annual report covering watermaster service within the South Fork Pit River Watermaster Service Area, Modoc and Lassen Counties, California, during the 1947 season.

The report presents a general description of the work and a discussion of the results obtained. Records of precipitation, run-off and other pertinent data are included.

Respectfully submitted,

/s/ HARRISON SMITHERUM  

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Harrison Smitherum  
Supervising Hydraulic Engineer

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REPORT ON  
WATERMASTER SERVICE  
IN  
SOUTH FORK PIT RIVER WATERMASTER SERVICE AREA  
MODOC AND LASSEN COUNTIES, CALIFORNIA  
1947 SEASON

INTRODUCTION

The South Fork Pit River Watermaster District, now Watermaster Service Area, Counties of Modoc and Lassen, California, was created by the order of the Division of Water Resources, entered December 31, 1934. As created the service area embraced the water rights determined by a decree entered October 30, 1934, by the Superior Court, Modoc County, in the case of W. E. Armstrong vs. Frank McArthur, et al. No. 3273, with the exception of certain rights defined in the paragraphs of said decree enumerated in said order. Subsequent thereto, orders changing said service area have been entered by the Division of Water Resources on December 31, 1936, whereby certain water rights on springs and spring channels near Likely, California, were excluded; on April 19, 1937, whereby the water rights of the South Fork Irrigation District were included in the watermaster service area; and on January 30, 1940, whereby the said service area was enlarged by incorporating therein the Pine Creek and Hot Springs Valley Watermaster Districts, theretofore created by the orders entered by the Division of Water Resources on January 12, 1935.

Watermaster service in the South Fork Pit River Watermaster Service Area for 1947 season covered the regulation of diversions from the South Fork of Pit River and its tributaries, Pit River and Rattlesnake Creek in Hot Springs Valley, and Pine Creek near Alturaw all included within

the scope of the service area as enlarged by said order of January 30, 1940. Watermaster service was carried on throughout the season in accordance with the "Distribution of Water" procedure contained in Sections 400<sup>0</sup> to 4360, inclusive, of the Water Code. Such service extended over the period from April 1 to September 30. J. Victor Scammon, Deputy Watermaster, South Fork Pit River Watermaster Service Area, administered the distribution of water from the various streams within the district during the period April 1 to September 30. Harrison Smitherum was Supervising Watermaster.

### WATER SUPPLY

#### Precipitation

The results of the annual snow surveys made on the four courses in the Upper Pit River watershed are shown in Table 1 of this report. The table is arranged to show the water content of the snow at the beginning of the run-off period, April 1 to July 31, inclusive, as compared with the average water content over years of actual measurements. This information is used to forecast the probable April - July flow of the South Fork of Pit River above Likely, and enables the watermaster to rough out a schedule of operation for the irrigation season. The forecast of the probable run-off is especially valuable in the operation of West Valley Reservoir.

Table 2 gives the monthly, seasonal and average amounts of precipitation for stations in the Upper Pit River Area. Each of the Stations listed has a common 18 year record and comparisons are made using the 18 year averages. For precipitation data prior to 1940-41 reference is made to the watermaster report for the 1940 season, and for 1940-41 to 1944-45 reference is made to the watermaster report for the 1945 season.

#### Stream Flow

South Fork Pit River: The record of the daily discharge of the South Fork of Pit River above Likely is given in Table 3. These data were

compiled from records of the United States Geological Survey. The station is below the junction of West Valley Creek and about four miles upstream from Likely. The data exclude any record of use in Jess Valley and storage in West Valley Reservoir, but do include the record of storage releases from that reservoir.

Table 4 is a record of the daily releases, in cubic feet per second, for West Valley Reservoir during the irrigation season.

The total net available water supply of the South Fork of Pit River for the irrigation season from April 1 to September 30 is shown in Table 5.

A comparison of the seasonal irrigation water supply to the South Fork Area over a 19 year period is given in Table 6.

The basic data for a comparison of the run-off in the South Fork of Pit River above Likely to the results of the annual snow surveys is given in Table 7. The Division of Water Resources issues an annual snow survey report as of April 10th, in which forecasts for the April 1 - July 31 flow are made. The 1947 forecast of the South Fork of Pit River above likely was 20,000 acre feet. The actual flow of that period was 20,630 acre feet.

Plate 1 shows graphically the data presented in Tables 3 and 4. The solid line represents the total discharge of the South Fork Pit River flow and the dotted line the storage releases from West Valley Reservoir.

Fitzhugh Creek: Table 8 is a record of the available water supply of Fitzhugh Creek above the Clark Ranch. The daily discharge data were computed from current meter measurements and a continuous record of the water stage throughout the entire season. This creek flows in a westerly direction entering the South Fork Valley at a point about 10 miles south of Alturas.

Pine Creek Near Alturas: Table 9 is a record of the flow of Pine Creek near Alturas at the Power House. A continuous water stage recorder is

Maintained by the Division of Water Resources at a point above all irrigation diversions. Plate II shows the daily hydrograph of flow prepared from the data in Table 9.

Table 10 gives the basic data for a comparison of the run-off in the Pine Creek Basin to the results of the annual snow surveys. No forecast is made for this creek in the annual snow survey bulletin issued by the Division of Water Resources.

Pit River and Rattlesnake Creek in Hot Springs Valley and Big Sage Reservoir: The principal sources of water for irrigation in the Hot Springs Valley are the North and South Forks of Pit River, Big Sage Reservoir, and Rattlesnake Creek. Water from the latter source enters Pit River about four miles west of Alturas and is principally in the form of water stored in Big Sage Reservoir which is released down Rattlesnake Creek to meet irrigation demands.

Prior to 1940, the flow entering at the head of Hot Springs Valley was measured at the Station on Pit River below the junction of the North and South Forks. Channel improvements made on the North Fork of Pit River in the winter of 1939 now causes the water from that source to by-pass the station so that measurements there are of no value. Furthermore, due to backwater conditions from river dams it has not been feasible to establish a new measuring station below the new junction of the North Fork and South Fork of Pit River. Therefore, no record of the flow entering Hot Springs from these sources is presented in this report.

Table 11 is a record of water released from storage in Big Sage Reservoir. Table 12 presents a comparison of the seasonal operations for the years 1935 to 1947, inclusive.

Below Rattlesnake Creek there are other small streams tributary

to Pit River in Hot Springs Valley which contribute to the water supply during the early part of each season. In 1947 the flow from these sources failed about May 15.

A stream flow measuring station is maintained by the U. S. Geological Survey on Pit River near Canby. This station is located at the outlet of Hot Springs Valley, and in the absence of other records, the flow at this station is indicative of water supply conditions in the Hot Springs Valley area. The record of this station, also covers the measurement of return flow from irrigation in the area. Table 13 is a record of the flow of Pit River near Canby, as taken from records compiled by the U. S. Geological Survey.

A hydrograph prepared from the data in Table 12 is presented on Plate III. Superimposed thereon is a hydrograph of the flow released from Big Sage Reservoir.

#### DISTRIBUTION OF WATER

##### South Fork of Pit River

The regulation of diversions of the natural flow from the South Fork of Pit River, including Fitzhugh Creek and other upstream tributaries, was made in accordance with Schedules 2 and 3 of the South Fork of Pit River Judgment and Decree No. 3273, which set forth the several rights and priorities. The natural flow of West Valley Creek, less the amounts of the allotments of the Van Loan West Valley Ranch, was permitted to pass through the West Valley Reservoir without charge as regulated storage release.

The regulation of West Valley Reservoir storage was performed in accordance with the by-laws adopted by the South Fork Irrigation District. Water released from the reservoir flows down the natural channels and commingles with the natural run-off, but is separated again by the watermaster at

the points of diversion of each member of the district requesting reservoir water. The amount of water to which each person was entitled was determined by multiplying the amount of the total storage at the beginning of the season by the percentage factor of each owner listed below:

<u>Name</u>	<u>Per Cent</u>
W. E. Armstrong (Now Arthur N. Burmister)	2.18
V. F. Christenson	20.46
A. T. Coffman (Now Kenneth Flournoy)	0.73
J. D. Flourney (Now Arthur Flournoy)	3.98
W. H. Flourney (Now D. E. Van Loan)	2.51
R. O. Gaustad (Now Jacob F. Derner)	1.79
R. J. Gaustad (Now Peter and John McGarva)	1.95
Jesse Hughes (Now Maston Ramsey)	2.23
Frank McArthur	45.62
Douglas McGarva	0.24
John and Peter McGarva	2.63
K. Nelson	2.74
Ray Stepp (Now Arthur H. Burmister)	1.07
A. L. Stinson (Now Arthur Flournoy)	0.03
D. E. Van Loan	8.53
Gary Williams	2.51
Roy Williams (Now Somer and Georgia Beeson)	0.80
	<u>100.0</u>

The outlook for the supply of irrigation water appeared far below normal before the start of the 1947 irrigation season,, as was shown by resolutions made by South Fork Irrigation District. (See correspondence file)

On April 5th, West Valley Reservoir was opened for a period of eight days in order to finish the pre-irrigation of certain grain lands owned by Frank McArthur before spring planting of barley. Pre-irrigation of grain land has in other years been accomplished, by using early run-off prior to the beginning of meadow irrigations. However, the very limited early run-off necessitated release of reservoir water earlier than usual. Water from West Valley Reservoir was again necessary May 15th to supplement the natural flow with all share holders participating in it's use. Release was continued until May 29th when a storm again increased the natural flow sufficiently to satisfy irrigation requirements. Water from West Valley Reservoir was used after the haying season for the irrigation of fall pasture

in the customary manner with all users taking their presentage allotments.

The mean daily release for the 1947 season from West Valley Reservoir is given in Table 4.

#### Pine Creek near Alturas

Distribution of Pine Creek water was made in accordance with the allotments set forth in Sechedule 2 of the Pine Creek Agreement. The season's flow for 1947 was below average. It amounted to 5,870 acre-feet as compared with the 29 year mean of 7,730 acre-feet. For other comparisons see Table 10.

No water was allowed to be stored in Dorris Reservoir after March 31. Water requirements on Pine Creek were more than the amount available throughout the 1947 season.

#### Hot Springs Valley

Distribution of Pit River water was made in accordance with the allotments set forth in Schedules 2 and 3 of the Hot Springs Valley Agreement. The distribution of Big Sage Water was made in accordance with the by-laws of the Hot Springs Valley Irrigation District. However, the major part of the water from both sources is used by the same parties through the same irrigation system and devices. The same method of distributing the water also applies to both stored water and natural flow. The Godfrey Dam was used to back water over Dorris lands for the first time since the dam was rebuilt in 1939. The regulation of this dam has been agreed upon by the interested parties and the agreement dated June 12, 1919, is recorded in the office of the Modoc County Recorder.

#### Summary

At the commencement of the 1946 irrigation season a critical shortage of water was expected. Rain during the last few days in May and the first of June eased the situation materially and resulted in good to excellent crops in the Area.

No water was sold to Big Valley users in 1947 as Hot Springs Valley users had to rely on carry over storage in Big Sage Reservoir almost entirely.

### Controversies

Some difficulty was experienced in measuring allotments to many of the users because of inadequate measuring devices. The watermaster has asked the owners of many of the conduits to supply measuring devices and although no definite refusals have been made by the owners very little progress has been made except in instances where the watermaster has taken the initiative and time to do most of the work. It has been found, that without the help of someone experienced in making measuring devices, the attempt is usually unsuccessful.

## OWNERSHIP OF LANDS AND WATER RIGHTS

### WITHIN SOUTH FORK PIT RIVER WATERMASTER SERVICE AREA

#### Changes in Ownership

On September 30, 1947, a search was made through the official records of Modoc County for recent changes in ownership in lands and water rights embraced in the South Fork Pit River Watermaster Service Area. Further assistance came from various persons living within the area who furnished additional information concerning transfers of ownership

The changes in ownerships of lands and water rights, which have occurred subsequent to filing "Statement for South Fork Pit River Watermaster Service Area, Counties of Modoc and Lassen, California, for 1947," are listed in the following tabulation. The new names should appear in the 1948 statement.

Tract No.	Name of Water Right Owner Appearing in 1947 Statement	Name of water Right Owner to Appear in 1948 Statement	Amount of Water c.f.s.
7-5	Felice Leoni	Walter and Elsie A. Cantrall	2.10
7-6	Della Johnson and Bessie Whitman	Donald Flournoy, Robert Flournoy and Warren Flournoy	0.15
7-11	John Elevins	Cecil Elevins	1.04
7-13	John Elevins	Cecil Elevins	0.82
7-22	Elmer R. and Victoria V. Rhyne	Arthur Kenneth and Mary M. Flournoy	2.08
7-36	George M. and J. E. Clark; B. C. and Dorothy Taylor	George M. and J. E. Clark; P. W. and Eileen A. Hignell	5.00
7-41	Ernest and Rose Dygert	Patrick Walsh	2.05
7-49	Milton R. and Harriette C. Irwin	W. C. Rodman	1.55
7-55	Harry D. Essex	Brewster Ebbe	0.70
7-64	Fred Ball	Fred Ball and Everett Starkebaum	0.71
7-65	Fred Ball	Fred Ball and Everett Starkebaum	0.06
7-71	J. P. Essex	Marion Fisher	0.045
7-74	Anna and Estate of Roderick McArthur	Marvin and Frankie Brown	15.92

TABLE 4  
SNOW SURVEY DATE—UPPER PIT RIVER

	:1945	:1956	:1947	:1948	:1949	:1950	::	:1945	:1946	:1947	:1948	:1949	:1950
:Eagle Peak Course	:	:	:	:	:	:	::	:	:	:	:	:	:
: Elev. 7500 Ft.	:	:	:	:	:	:	::	: Course—	:	:	:	:	:
: Date of Survey	: 3/30:	4/5 :	4/2:	:	:	:	::	: Elev. 6500 Ft.	:	:	:	:	:
: Depth of Snow—	:	:	:	:	:	:	::	: Date of Survey	: 4/3 :	3/26:	3/31:	:	:
: Inches	: 63.5:	53.3:	22.2:	:	:	:	::	: Depth of Snow—In.	: 41.2:	44.0:	13.4:	:	:
: Water Content—	:	:	:	:	:	:	::	: Water Content—In.	: 15.8:	16.2:	4.4:	:	:
: Inches	: 22.2:	21.2:	6.4:	:	:	:	::	: Density—Percent	: 38.4:	37.0:	32.8:	:	:
: Density—Percent	: 35.0:	39.8:	28.8:	:	:	:	::	: Record Average—In	: 12.2:	12.5:	12.0:	:	:
: Record Average—	:	:	:	:	:	:	::	: % of Record Aver.	: 129.5:	129.6:	36.6:	:	:
: Inches	: 15.8:	16.1:	15.5:	:	:	:	::	: Blue Lake Ranch	:	:	:	:	:
: % of Record Aver.	: 140.5:	131.7:	41.0:	:	:	:	::	: Course Elev.	:	:	:	:	:
: Cedar Pass Course	:	:	:	:	:	:	::	: 7300 Ft.	:	:	:	:	:
: Elev. 7200 Ft.	:	:	:	:	:	:	::	: Date of Survey	: 4/3 :	4/3 :	4/1 :	:	:
: Date of Survey	: 3/29:	3/28:	3/31:	:	:	:	::	: Depth of Snow—	:	:	:	:	:
: Depth of Snow	:	:	:	:	:	:	::	: Inches	: 44.0:	44.9:	17.5:	:	:
: Inches	: 67.5:	55.4:	26.0:	:	:	:	::	: Water Content—	:	:	:	:	:
: Water Content	:	:	:	:	:	:	::	: Inches	: 15.8:	16.2:	5.3:	:	:
: Inches	: 22.4:	22.9:	10.3:	:	:	:	::	: Density—Percent	: 35.9:	36.1:	30.4:	:	:
: Density—Percent	: 33.2:	41.3:	39.6:	:	:	:	::	: Record Average—	:	:	:	:	:
: Record Average—	:	:	:	:	:	:	::	: Inches	:	:	11.0:	:	:
: Inches	: 17.2:	17.5:	17.1:	:	:	:	::	: % of Record	:	:	:	:	:
: % of Record	:	:	:	:	:	:	::	: Average	:	:	:	:	:
: Average	: 130.2:	130.8:	60.0:	:	:	:	::	: Average	:	:	48.0:	:	:

For records prior to 1945, see 1946 report.

**TABLE 2**  
**PRECIPITATION - UPPER PIT RIVER STATIONS - 1929 to 1947**  
**MONTHLY, SEASONAL AND AVERAGE AMOUNTS IN INCHES**

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Season
Joni Valley, Modoc County, California, Elev. 5,400 ft.													
10 Yr. Total	19.35	23.75	26.22	19.22	36.48	25.73	29.82	27.87	21.87	0.00	3.22	11.28	205.2
1945-1946	1.31	3.25	2.29	1.44	1.28	2.53	0.59	1.32	0.98	0.70	0.20	0.41	16.44
1946-1947	1.61	1.10	1.77	0.07	0.45	1.56	0.93	3.05	2.13	0	0.05	0.27	13.62
10 Yr. Total	22.33	27.94	30.28	20.73	38.21	32.82	30.94	31.87	24.97	6.70	3.47	11.96	283.06
10 Yr. Rec. Mean	1.24	1.55	1.82	1.24	2.01	1.81	1.72	1.71	1.37	0.48	0.19	0.59	16.48
Alturas, Modoc County, California, Elev. 4,450 ft.													
10 Yr. Total	16.16	20.17	20.04	21.07	25.30	19.80	27.17	20.07	11.84	3.47	2.94	5.79	195.43
1945-1946	2.09	2.08	1.47	0.72	0.58	1.49	0.48	0.72	0.48	0.67	1	0.12	10.96
1946-1947	0.83	1.07	1.00	0.31	0.88	0.83	0.69	1.20	1.06	0	0.47	0.25	9.20
10 Yr. Total	19.08	23.14	29.16	22.22	26.76	21.92	18.54	18.61	13.40	4.14	3.41	6.17	215.55
10 Yr. Rec. Mean	1.06	1.29	1.62	1.73	1.49	1.22	1.02	1.03	0.74	0.23	0.29	0.34	11.96
Iakaview, Lake County, Oregon, Elev. 4,720 ft.													
10 Yr. Total	17.92	20.04	21.07	27.81	25.50	21.50	20.63	21.08	15.19	2.42	2.55	8.49	221.79
1945-1946	1.19	1.60	1.81	1.19	0.50	1.27	0.21	0.32	0.35	0.42	1	0.25	9.54
1946-1947	1.45	1.81	1.55	0.29	0.67	1.57	0.74	1.80	2.36	0	0.06	0.32	13.62
10 Yr. Total	20.56	24.02	32.43	29.29	31.13	25.74	21.56	23.80	21.53	2.84	3.01	9.02	244.95
10 Yr. Rec. Mean	1.14	1.73	1.85	1.63	1.73	1.41	1.20	1.32	1.20	0.16	0.17	0.50	13.51
Hibers, Lassen County, California, Elev. 4,208 ft.													
10 Yr. Total	21.01	25.05	41.75	45.52	43.24	31.70	22.85	21.40	11.11	2.71	0.29	0.00	270.23
1945-1946	2.43	2.97	2.93	1.80	2.32	1.70	1.27	0.82	0.27	0.50	0	0.22	17.23
1946-1947	0.54	1.20	2.74	0.60	1.50	1.01	0.70	2.25	1.17	0	0.35	0.29	14.17
10 Yr. Total	24.00	30.60	47.42	47.92	47.12	35.11	24.61	24.47	17.57	3.21	1.34	7.16	301.53
10 Yr. Rec. Mean	1.37	1.70	2.65	2.38	2.62	1.95	1.38	1.35	0.70	0.70	0.18	0.07	16.76

For records prior to 1940-1941, see 1940 Report  
 For records prior to 1945-1946, see 1945 Report

TABLE 3  
 DAILY DISCHARGE IN CUBIC FEET PER SECOND  
 SOUTH FORK PIT RIVER ABOVE LIKELY  
 For Year Ending September 30, 1947

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	39	31	29	21	27	26	27	91	98	21	88	54
2	44	27	27	20	28	27	27	94	76	17	87	54
3	58	25	27	19	30	28	30	103	65	19	83	47
4	55	25	33	19	34	31	39	102	59	22	83	31
5	54	25	40	20	35	27	56	92	82	20	88	30
6	43	28	42	21	38	25	81	86	111	19	100	30
7	28	28	35	21	40	30	82	83	98	17	126	32
8	27	27	34	22	36	30	97	78	96	11	124	32
9	25	27	32	24	37	29	104	104	144	12	124	33
10	26	27	27	27	40	29	87	92	114	10	124	26
11	25	28	29	27	35	31	68	83	91	12	131	10
12	25	27	31	27	56	27	66	72	79	13	152	16
13	23	27	30	26	53	28	57	67	63	14	152	16
14	20	28	20	25	42	29	41	60	60	14	142	16
15	22	36	30	22	38	30	46	59	56	13	133	16
16	23	31	26	20	36	33	57	66	63	11	131	16
17	28	30	25	18	34	36	77	66	78	14	129	17
18	30	30	24	18	32	39	117	63	58	36	127	17
19	30	38	30	20	30	40	119	66	47	58	105	19
20	29	32	33	25	30	41	117	71	40	76	47	19
21	31	33	34	27	27	40	111	83	39	81	46	19
22	35	39	32	27	28	41	98	100	36	81	51	18
23	39	39	30	26	28	44	96	102	44	81	54	17
24	34	34	28	28	28	40	92	102	59	74	53	16
25	31	31	26	29	28	37	87	103	58	71	53	17
26	30	30	25	33	27	34	84	103	56	73	53	17
27	28	28	24	33	30	37	87	120	53	74	53	12
28	27	27	23	30	28	35	82	127	55	72	54	12
29	25	29	22	26		35	84	73	54	71	56	12
30	26	30	22	26		33	87	86	38	104	57	12
31	26		21	27		31		127		102	56	
<b>Total</b>	<b>986*</b>	<b>897*</b>	<b>901*</b>	<b>754*</b>	<b>955*</b>	<b>1023*</b>	<b>2293*</b>	<b>2724*</b>	<b>2070</b>	<b>1313*</b>	<b>2862*</b>	<b>683</b>
<b>Mean</b>	<b>31.8</b>	<b>29.9</b>	<b>29.1</b>	<b>24.3</b>	<b>34.1</b>	<b>33.0</b>	<b>76.4</b>	<b>87.9</b>	<b>69.0</b>	<b>42.4</b>	<b>92.3</b>	<b>22.8</b>
<b>acres-</b>												
<b>Feet</b>	<b>1,960</b>	<b>1,780</b>	<b>1,790</b>	<b>1,500</b>	<b>1,890</b>	<b>2,030</b>	<b>4,550</b>	<b>5,400</b>	<b>4,110</b>	<b>2,600</b>	<b>5,680</b>	<b>1,350</b>

268  
 692  
 Mean - 47.8  
 Acres Feet - 34,640  
 1172  
 387  
 1610  
 9580  
 710  
 37  
 4328  
 3753  
 1095

TABLE 4  
 MEAN DAILY RELEASE IN CUBIC FEET PER SECOND  
 WEST VALLEY RESERVOIR  
 For Season Ending September 30, 1947

Day	April	May	June	July	Aug.	Sept.	Oct.
1					65	37	4
2					62	37	4
3					62	37	4
4					70	19	4
5	*50				70	17	4
6	50				90	17	4
7	63				105	17	4
8	63				105	17	4
9	63				105	17	4
10	45				105	17	4
11	45				105	0	4
12	45				135	7	4
13					135	7	**2
14					135	7	
15		18			135	7	
16		18			135	7	
17		18		6	135	7	
18		18		27	80	7	
19		29		40	50	7	
20		29		60	30	7	
21		64		65	30	7	
22		64		65	35	7	
23		64	12	64	37	7	
24		64	26	56	37	7	
25		64	26	54	37	7	
26		64	26	54	37	7	
27		31	26	54	37	4	
28		31	26	54	37	4	
29		15	26	54	37	4	
30		0	12	54	37	4	
31		--	--	110	37	--	
Total	424	591	180	812	2312	353	50
Total							
Acre-Ft.	841	1172	357	1610	4585	700	99

Total Acre-feet for Season - 9364

\* Reservoir first opened - Storage 12,500 acre -feet

\*\* Reservoir last closed - Storage 3,710 acre-feet

TABLE 5  
 TOTAL SEASONAL IRRIGATION WATER SUPPLY OF THE  
 SOUTH FORK OF PIT RIVER ABOVE LIKELY  
 APRIL 1 TO SEPTEMBER 30, 1947

	April	May	June	July	Aug.	Sept.	Total
U.S.G.S. Record #693	4,550	5,400	4,110	2,600	5,680	1,350	23,690
Operation-West Valley Reservoir	+ 700	+ 570	+ 400	-1,600	-4,600	= 800	- 5,330
Consumption in Jess Valley	0	900	1,800	1,200	500	500	4,900
Full Natural Flow	5,250	6,870	6,310	2,200	1,580	1,050	23,260

20,630 acre-feet natural flow, April 1 to July 31

#### WEST VALLEY RESERVOIR

Reservoir did not spill during the 1947 season.

No diversion was made through intake ditch from South Fork of Pit River into reservoir in 1947. The intake ditch was cleaned throughout its entire length and enlarged in sections during the Fall of 1947.

No consideration is given to consumptive use above West Valley dam or diversion from Cedar Creek into Tule Lake Reservoir in the above table. Cedar Creek and Tule Lake Reservoir will not contribute to the flow of South Fork of Pit River as in previous years because construction of a large dam across Cedar Creek and Tule Lake outlet has raised the spillway level to such a height that water may never spill again from Cedar Creek into West Valley.

TABLE 6  
 COMPARISON OF RUNOFF IN ACRE-FEET DURING IRRIGATION SEASON  
 SOUTH FORK OF PIT RIVER ABOVE LIKELY  
 From 1929 to 1947

Year	April	May	June	July	Aug.	Sept.	Seasonal Total
Acre Feet							
1929	3,930	7,480	4,180	1,160	664	714	18,128
1930	6,410	7,750	2,950	956	830	1,160	20,056
1931	2,200	1,580	721	474	638	626	6,239
1932	7,440	19,600	9,160	2,370	1,390	1,040	41,000
1933	3,370	5,260	4,290	898	910	857	15,585
1934	3,250	2,020	2,210	658	613	649	9,400
1935	8,020	17,920	9,790	2,050	1,470	966	40,216
1936	11,700	12,640	6,360	1,640	1,360	1,280	34,980
1937	2,840	8,380	4,500	3,000	5,830	920	25,470
1938	10,960	29,700	11,840	3,020	7,950	3,100	66,570
1939	5,600	5,790	4,630	3,410	5,570	855	25,855
1940	3,260	8,610	5,000	4,150	6,540	1,680	31,240
1941	4,100	13,630	6,220	3,520	6,990	1,660	36,140
1942	9,400	17,640	12,400	3,410	8,490	2,320	53,660
1943	16,210	16,400	11,960	4,650	9,400	3,110	61,730
1944	3,470	9,110	9,210	3,570	6,500	4,550	36,410
1945	5,110	20,870	15,310	3,490	7,970	3,910	56,660
1946	9,920	13,460	6,590	2,690	7,290	1,690	41,640
1947	4,550	5,400	4,110	2,600	5,620	1,350	23,690

Above data taken from the U.S.G.S. records of flow of the South Fork Pit River above Likely, California.

Irrigation diversions above station were not regulated by watermaster prior to 1933.

Storage releases from West Valley Reservoir began in 1937.

TABLE 7

## SNOW SURVEY DEDUCTIONS

COMPARING FULL NATURAL RUNOFF, APRIL 1 to JULY 31  
SOUTH FORK OF PIT RIVER ABOVE LIKELY, TO PINE CREEK NEAR ALTURAS  
IN RELATION TO SNOW WATER CONTENT, ON EAGLE PEAK APRIL 1

Year	Natural Flow Pine Creek Acre-Feet	Natural Flow So. Fk. Pit River Acre-Feet	Water Content Eagle Peak Inches
1919	5,953		
1920	6,675		
1921	10,260		
1922	7,780		
1923	5,110		
1924	5,100		
1925	7,920		
1926	6,199		
1927	10,080		
1928	7,640		
1929	5,495		
1930	5,894	24,000	11.0
1931	2,615	11,000	5.2
1932	10,300	44,500	11.7
1933	5,665	19,800	14.3
1934	3,453	13,400	3.3
1935	9,293	45,300	22.6
1936	9,300	38,300	22.1
1937	5,510	25,800	17.5
1938	12,890	64,800	23.6
1939	4,604	19,320	10.4
1940	6,796	23,500	15.6
1941	7,180	31,480	13.8
1942	9,450	45,780	14.7
1943	13,700	52,580	23.7
1944	8,710	31,610	13.3
1945	14,800	51,630	22.2
1946	8,190	34,320	21.2
1947	5,870	20,630	6.4*
Total			
18 Yr.	144,220	597,750	279.8
Total			
29 Yr.	222,432		
18 Yr.			
Mean	8,010	33,210	15.5
29 Yr.			
Mean	7,670	31,800*	14.8*

\* Computed

TABLE 8  
DAILY DISCHARGE IN CUBIC FEET PER SECOND  
FITZHUGH CREEK ABOVE CLARK RANCH  
APRIL 1, TO SEPTEMBER 30, 1947.

Day	April	May	June	July	Aug.	Sept.
1	2.2	10.0	10.6	1.3	0.3	0.3
2	4.8	9.5	7.0	1.2	.5	.3
3	6.5	9.5	5.4	1.0	.5	.3
4	6.8	9.5	4.3	0.9	.5	.3
5	8.0	9.5	5.2	.9	.5	.3
6	10.5	9.3	10.2	.9	.5	.3
7	12.1	8.2	12.8	.9	.6	.3
8	13.5	7.4	11.4	.8	.6	.3
9	16.5	9.0	13.6	.8	.6	.3
10	18.0	11.0	11.4	.8	.6	.3
11	17.0	10.5	7.6	.8	.5	.3
12	17.0	10.0	6.6	.8	.5	.3
13	18.0	9.0	5.4	.8	.5	.3
14	18.0	8.0	4.6	.7	.5	.3
15	20.0	7.5	4.0	.7	.5	.3
16	16.5	7.0	3.6	.7	.5	.3
17	16.0	6.8	4.9	.6	.5	.3
18	15.5	5.6	4.8	.6	.4	.3
19	14.5	5.6	3.2	.5	.4	.3
20	15.0	8.0	2.9	.5	.4	.3
21	15.5	5.0	2.4	.4	.5	.3
22	15.0	4.7	2.2	.3	.6	.3
23	15.0	4.7	2.1	.3	.5	.3
24	13.0	4.5	2.0	.2	.4	.3
25	12.0	3.8	1.7	.2	.4	.3
26	12.0	1.4	1.5	.2	.4	.5
27	11.0	5.0	1.4	.2	.3	.5
28	11.0	8.8	1.2	.2	.3	.5
29	10.0	6.5	1.3	.2	.3	.5
30	10.0	3.8	1.3	.2	.3	.5
31		7.0		.2	.4	
<b>Total</b>	<b>392</b>	<b>226</b>	<b>157</b>	<b>19</b>	<b>14</b>	<b>10</b>
<b>Mean</b>	<b>13.1</b>	<b>7.3</b>	<b>5.2</b>	<b>0.6</b>	<b>0.5</b>	<b>0.3</b>
<b>Total Run</b>						
<b>in A.F.</b>	<b>777</b>	<b>448</b>	<b>311</b>	<b>38</b>	<b>28</b>	<b>20</b>

Total acre-feet for season - 1622

TABLE 9  
 DAILY DISCHARGE IN CUBIC FEET PER SECOND  
 PINE CREEK NEAR ALTURAS AT POWER HOUSE  
 APRIL 1 TO SEPTEMBER 30, 1947.

Day	April	May	June	July	Aug.	Sept.
1	14.0	31.0	38.5	19.5	10.0	5.6
2	13.5	36.0	33.5	13.3	9.5	10.0
3	15.0	36.0	30.5	17.8	6.4	9.5
4	15.0	37.5	32.5	16.4	8.5	8.5
5	15.0	46.5	36.0	13.3	10.9	8.1
6	15.5	48.0	37.5	8.5	10.5	5.6
7	15.5	46.5	36.0	15.5	10.9	5.4
8	16.0	49.0	36.0	17.0	10.0	5.6
9	21.5	53.0	46.5	14.5	8.9	6.9
10	24.0	44.0	42.5	16.0	7.2	6.9
11	16.0	41.5	41.5	12.8	7.5	8.2
12	13.5	44.0	39.5	11.0	8.1	7.8
13	8.5	37.5	38.7	9.5	7.9	7.5
14	13.0	31.0	35.0	13.0	8.1	7.5
15	15.5	31.5	35.0	13.0	8.1	6.9
16	19.5	29.5	39.5	12.4	8.1	8.5
17	21.5	29.0	32.0	11.8	7.8	8.1
18	19.5	29.0	32.0	11.8	7.8	8.1
19	19.5	31.5	31.5	10.5	7.8	7.5
20	19.0	30.0	30.0	7.5	8.5	7.5
21	19.0	28.5	27.0	10.5	8.5	7.5
22	18.0	28.5	25.0	12.8	8.5	6.9
23	18.0	28.5	28.0	10.5	7.8	6.9
24	19.0	27.0	26.0	10.5	7.8	6.9
25	19.5	25.0	24.5	10.5	7.8	6.9
26	18.0	28.5	22.0	8.9	8.5	6.9
27	18.0	32.0	21.5	6.8	9.1	6.9
28	24.5	35.0	19.5	10.0	8.5	6.9
29	27.0	28.5	17.0	10.5	7.8	6.9
30	28.5	28.5	22.0	10.5	7.8	6.9
31		31.0		10.5	5.4	
<b>Total</b>	<b>540</b>	<b>1084</b>	<b>958</b>	<b>377</b>	<b>260</b>	<b>221</b>
<b>Mean</b>	<b>18.0</b>	<b>35.0</b>	<b>31.9</b>	<b>12.2</b>	<b>8.4</b>	<b>7.4</b>
<b>Total Run off in A:</b>						
<b>Feet</b>	<b>1070</b>	<b>2150</b>	<b>1900</b>	<b>750</b>	<b>520</b>	<b>440</b>

Total Acre-feet for season - 6830

Total acre-feet for April to July 31 - 5870

TABLE 10  
COMPARISON OF AVERAGE SNOW WATER CONTENT ON  
CEDAR PASS AND EAGLE PEAK, WITH APRIL 1 TO  
JULY 31 PINE CREEK RUNOFF

Year	Runoff Acre-Foot	Average Water Content - Inches		
		Cedar Pass	Eagle Peak	Average
1919	5953			
1920	6675			
1921	10260			
1922	7780			
1923	5110			
1924	5100			
1925	7920			
1926	6199			
1927	10080			
1928	7640			
1929	5495			
1930	5894	13.0	11.0	12.0
1931	2615	8.0	5.2	6.6
1932	10300	19.8	18.7	19.2
1933	5665	19.8	14.3	15.3
1934	3453	0.9	3.3	2.1
1935	9293	21.1	22.6	21.8
1936	9300	26.2	22.1	24.1
1937	5510	21.6	17.5	19.6
1938	12890	25.2	23.6	24.4
1939	4604	10.5	10.4	10.4
1940	6796	14.6	15.6	15.1
1941	7180	17.9	13.8	15.8
1942	9450	19.3	14.7	17.0
1943	13700	25.8	23.7	24.7
1944	8710	12.3	13.5	12.9
1945	14800	22.4	22.2	22.3
1946	8190	22.9	21.2	22.0
1947	5870	10.3	6.4	8.4
18 Year Total	144220	308.1	279.8	293.7
29 Year Total	224260			
18 Year Mean	8010	17.1	15.5	16.3
29 Year Mean	7670	16.4*	14.8*	15.6

\* Computed

TABLE 11  
DAILY RELEASE IN CUBIC FEET PER SECOND  
BIG SAGE RESERVOIR  
APRIL 25 to OCTOBER 11, 1947

Day	April	May	June	July	Aug.	Sept.	Oct.
1		16		92	85	90	20
2		16		5	85	90	20
3		16		5	85	90	20
4		16		5	85	90	20
5		16		5	85	90	20
6		16		5	85	7	20
7		35		5	85	7	20
8		35		5	85	7	20
9		35		5	85	7	20
10		35		5	85	7	20
11		35		5	15	7	**20
12		35		5	15	7	
13		35		5	15	7	
14		95		5	15	7	
15		95		5	15	7	
16		95		5	15	7	
17		95		5	15	7	
18		95		5	15	7	
19		95		5	15	7	
20		95		5	15	7	
21		95		5	15	7	
22		95		85	15	7	
23		0		85	15	7	
24				85	15	7	
25	*16		92	85	15	20	
26	16		92	85	90	20	
27	16		92	85	90	20	
28	16		92	85	90	20	
29	16		92	85	90	20	
30	16		92	85	90	20	
31				85	90		
<b>Total:</b>	<b>96</b>	<b>1196</b>	<b>552</b>	<b>1042</b>	<b>1615</b>	<b>703</b>	<b>220</b>
<b>Mean:</b>	<b>16</b>	<b>54</b>	<b>92</b>	<b>34</b>	<b>52</b>	<b>23</b>	<b>20</b>
<b>Total:</b>							
<b>Ac. Ft.</b>	<b>190</b>	<b>2370</b>	<b>1090</b>	<b>2070</b>	<b>3200</b>	<b>1390</b>	<b>440</b>

\* Reservoir Opened

\*\* Reservoir Closed

Total release for season - 10,750

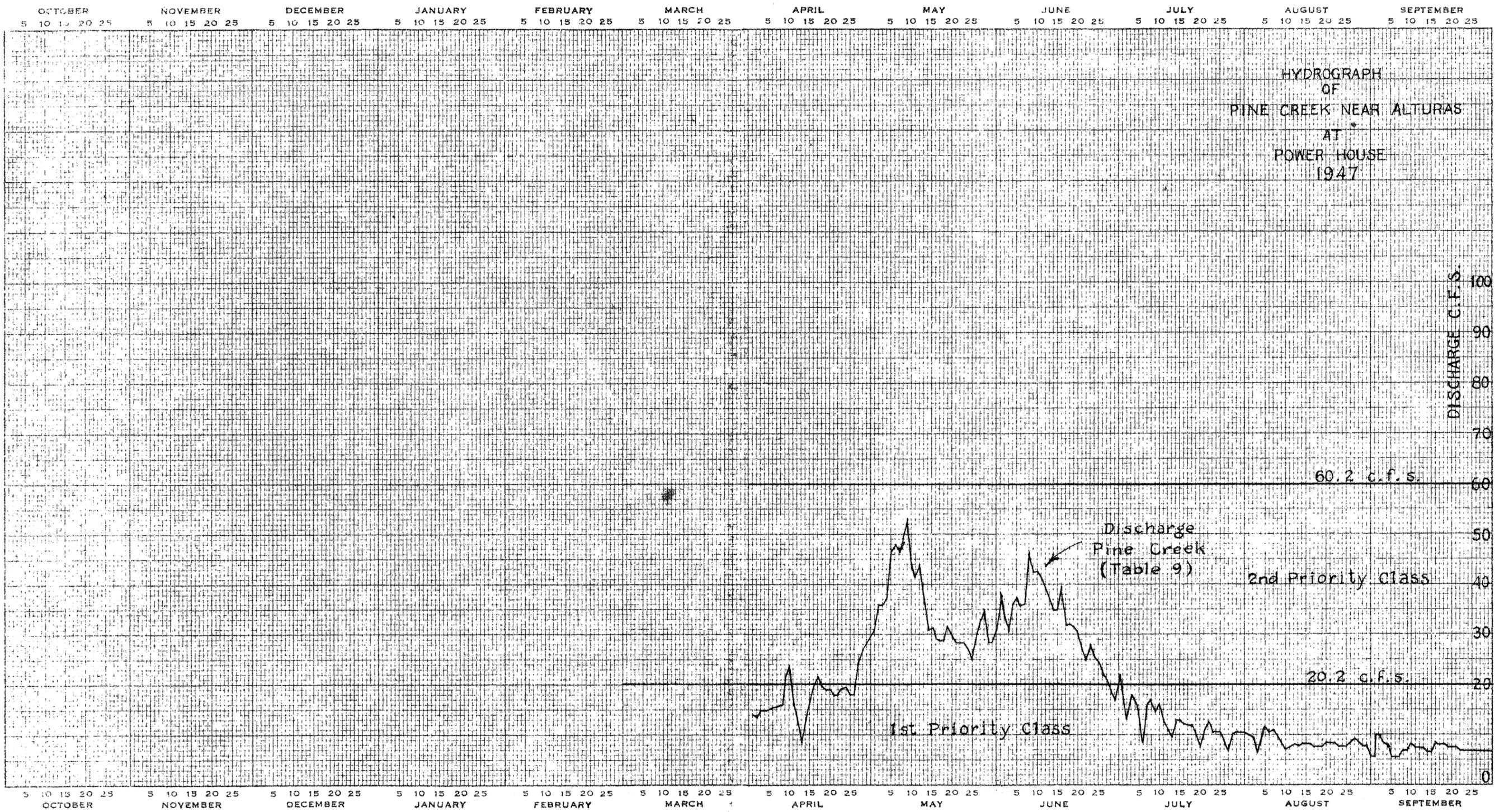
TABLE 13  
DAILY DISCHARGE IN CUBIC FEET PER SECOND  
PIT RIVER NEAR CANBY  
For Year Ending September 30, 1947

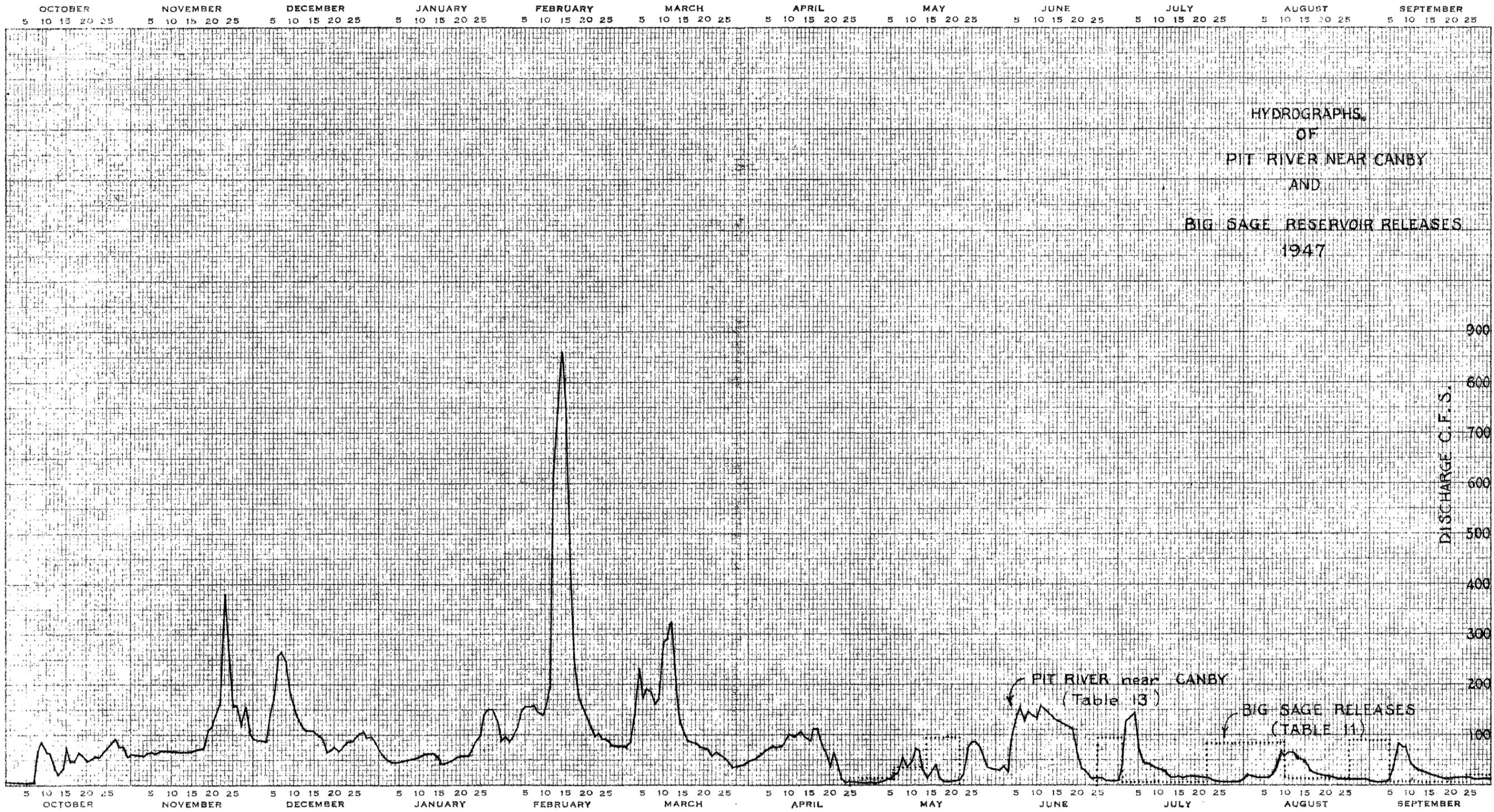
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.2	60	90	60	87	74	51	2.8	30	49	21	8.3
2	6.7	58	90	52	98	85	51	2.4	37	125	18	7.2
3	5.8	58	87	44	116	140	62	7.2	28	136	18	6.2
4	5.4	65	136	44	144	232	69	11	91	147	18	5.8
5	5.0	65	171	46	155	175	72	11	133	74	17	11
6	5.4	62	265	47	155	192	77	24	157	45	16	42
7	9.9	65	275	49	158	184	74	23	129	44	24	82
8	67	67	241	51	147	162	74	53	147	38	45	77
9	85	67	184	56	142	171	82	37	140	32	69	77
10	67	67	151	58	155	285	101	45	132	30	62	49
11	62	65	132	62	196	290	98	72	158	27	67	38
12	35	65	116	62	609	325	101	69	151	22	67	30
13	21	67	110	62	746	196	104	30	144	17	51	26
14	31	69	110	54	860	129	98	16	136	15	51	23
15	74	69	104	42	752	101	92	26	129	17	44	21
16	49	72	98	42	482	90	110	40	125	14	32	19
17	49	72	92	44	255	87	110	14	119	15	26	18
18	67	77	63	46	184	85	82	9.5	113	18	23	17
19	62	110	68	50	158	77	69	8.9	110	19	21	16
20	49	119	74	56	136	77	33	8.9	65	19	18	15
21	51	144	69	58	116	72	65	9.5	35	17	16	14
22	54	166	79	60	98	60	40	10	27	13	14	14
23	54	380	87	67	101	65	11	25	18	11	14	14
24	67	290	87	87	92	62	5.8	73	15	10	14	13
25	72	158	92	100	90	56	6.7	85	13	8.9	13	13
26	82	158	101	140	79	44	6.7	87	12	6.2	13	12
27	77	119	104	150	79	35	5.8	74	10	5.4	11	11
28	77	158	95	150	77	38	5.0	51	9.5	6.7	11	11
29	58	104	95	130		40	4.6	37	8.3	8.3	10	12
30	58	92	85	88		40	4.0	33	10	9.5	9.5	12
31	62		70	95		45		30		12	8.9	
Total	1475.4*	3188 *	3621 *	2152 *	6467 *	3714 *	1764.6	1035.2*	2431.8*	1011.0*	842.4*	714.5*
Mean	47.6	106	117	69.4	231	120	58.8	33.4	81.1	32.6	27.2	23.8
Acre-												
Feet	2,930	6,320	7,180	4,270	12,830	7,370	3,500	2,050	4,820	2,010	1,670	1,420

Year Mean - 77.9

Acre-Feet - 56,370







HYDROGRAPHS  
OF  
PIT RIVER NEAR CANBY  
AND  
BIG SAGE RESERVOIR RELEASES  
1947

PIT RIVER near CANBY  
(Table 13)  
BIG SAGE RELEASES  
(TABLE 11)